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ABSTRACT

The relationship between juvenile delinquency and learning disabilities has been studied in the context of socioeconomic status, temperament, school success, and peer relationships. To use a process-oriented approach in evaluating cognitive and learning profiles of delinquents and learning disabled adolescents, and to examine the possibility that a specific subgroup of delinquents might display learning profiles similar to the learning disabled, the educational and cognitive profiles of adolescent males (53 delinquent, 26 learning disabled, and 50 average achieving adolescents) were compared over a 2-year period. The Survey of Educational Skills was used to assess reading, spelling, written expression, mathematics, and cognitive problem solving abilities. An analysis of the results showed the existence of various subtypes of delinquency which could be differentiated using process-oriented cognitive and educational assessment techniques. One subtype was unique to delinquency and possibly reflected individuals with behavioral and social problems superimposed on specific learning profiles. A second subtype displayed cognitive and educational profiles which were virtually identical to learning disabled adolescents. The third subgroup was characterized by learning and cognitive profiles which were similar to those of average achievers. Using the process-oriented techniques, delinquency prevention and rehabilitation programs can better identify clients and develop programs to meet their unique needs. (BL)

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COGNITIVE AND LEARNING PROFILES OF DELINQUENT AND LEARNING-DISABLED ADOLESCENTS

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ABSTRACT

The association between juvenile delinquency and learning disabilities has been a focus of considerable discussion and controversy. However, investigations directly contrasting these two populations have been sparse. In the few studies that have examined the link between antisocial behavior and school problems, research methodology has varied. Thus, conflicting evidence has led to limited consensus. The present study was designed to address this issue by comparing the cognitive and learning profiles of delinquents and learning-disabled adolescents. Specifically, 53 delinquents, 26 learning-disabled adolescents, and 50 average achievers were evaluated on newly-developed educational and cognitive inventories. These assessment techniques were used to analyze several functional areas including processing efficiency, problem-solving, and response style. Discriminant analysis suggested the existence of various subtypes of delinquency based on the cognitive and educational profiles of these adolescents. Learning disabilities represented one of these subgroups. It was concluded that prediction of membership in these various subgroups holds promise for rehabilitation of adolescents and, in certain circumstances, prevention of juvenile delinquency.

BACKGROUND

The existence of a link between juvenile delinquency and learning disabilities has been a source of widespread discussion, limited research, and very little consensus. Recently, the relationship between juvenile delinquency and psychopathology has been examined within the context of socio-economic status, temperament, school success and peer relationships (Offord, 1983). As a result, the hypothesis that all forms of delinquency are caused by emotional disorders has been refuted. In fact, there has been increasing emphasis on the importance of academic difficulties as possible precursors of delinquency (Kratoville, 1974; Rutter, 1975, 1980). In this regard, epidemiological studies have indicated that over 50% of juvenile delinquents exhibit prior evidence of specific learning disabilities (Berman, 1974; Poremba, 1975). This association may result when early school failure leads to low self-esteem which, in turn, provokes anti-social behavior. A second possible explanation is that learning problems and juvenile delinquency may arise from co-existing factors such as socio-economic status, family size, and temperamental variables, and may not be etiologically linked. In fact, Offord (1983) has concluded on the basis of a variety of studies (e.g., Offord & Poushinsky, 1981; Offord, Poushinsky, & Sullivan, 1978) that both interpretations may apply to varying extents in different populations.

The consensus regarding this relationship between educational failure and juvenile delinquency has been limited by an almost exclusive emphasis on the presence of reading problems in these groups. Furthermore, most of the studies have addressed the question of reading deficit by evaluating the grade-levels attained while ignoring the qualitative differences in reading style. Few investigations have examined the academic performance of delinquents across other equally important educational areas such as written language, spelling, and mathematics. In the few studies which have examined error profiles (e.g., Mulligan, 1969), delinquents displayed reading errors similar to those noted in children with documented learning disabilities. These findings suggest the value of exploring profile analysis as an assessment technique for identifying learning difficulties in delinquents.

In a recent study (Meltzer, Levine, et al., in press), delinquent adolescents and junior high school students were compared on the basis of their learning styles and error patterns in eight skill areas. Significant differences emerged with regard to the type and prevalence of multiple errors within each of the educational skill areas and across the combined skills (e.g., reading, spelling, written language, and mathematics). It was found that the learning styles of delinquents seemed to be qualitatively different from those of normal achievers. It was concluded that the study should be extended one step further so that delinquents and learning-disabled children could be compared directly in terms of their learning profiles. Consequently, the present investigation was designed to examine these issues in further detail.

Specifically, this study compared the educational and cognitive profiles of delinquents, learning-disabled adolescents, and average achievers using the same assessment techniques. The objectives were as follows:

1. To utilize a process-oriented approach for evaluating the cognitive and learning profiles of delinquents and learning-disabled adolescents. This approach emphasized error analysis and quality of learning style in addition to grade-level assessment.

2. To utilize educational and cognitive profiles in order to examine the possibility that a specific subgroup of delinquents displayed learning profiles similar to those of learning-disabled adolescents.

METHOD

Subjects

The delinquent sample consisted of 53 white, English-speaking males recently committed to the Department of Youth Services of the Commonwealth of Massachusetts. Their mean age was 15 years, 1 month and their ages ranged from 13 to 16 years. Three different regions were selected to assure adequate representation of urban, suburban, and rural communities. The learning disability group consisted of 26 males within the same age range who were referred to an outpatient school problems clinic at The Children's Hospital. The comparison group comprised 50 predominantly junior high school males with a mean age of 14 years, 6 months who were recruited by random mailings to parents. They were selected from three schools in Watertown, Massachusetts, a community

whose socio-demographic characteristics were similar to those of the regions from which the delinquents were chosen.

Materials

(a) Educational Inventory

The Survey of Educational Skills (The Children's Hospital) was used for describing a profile of each youngster's strengths and weaknesses in four basic skill areas: reading, spelling, written expression, and mathematics (Meltzer et al., in press). A three-point rating scale was developed for qualitative analysis of response style, processing efficiency, and error patterns. This supplemented the grade-equivalent scores which were obtained in the basic skill areas. Traditional diagnostic indicators of learning problems were incorporated into the rating scale and emphasized language-based errors, visual-spatial deficits, and confusions of sequential order. Written language was evaluated using The Children's Hospital diagnostic writing inventory. This form of assessment includes measures of motor output, spatial organization, writing rhythm, and others (Meltzer et al., in press). Table 1 depicts the various measures of educational performance included in the Survey of Educational Skills.

Insert Table 1 about here.

(b) Cognitive Inventory

A process-oriented cognitive inventory was developed to evaluate problem-solving strategies and reasoning ability (Meltzer, in press). The inventory emphasized three major components of problem-solving: efficiency of strategy selection, modes of strategizing, and styles of strategizing. It was divided into two parts: a set of "non-linguistic" subtests for assessing non-verbal reasoning, and a set of "linguistic" subtests measuring verbal symbolic reasoning (see Table 2).

Insert Table 2 about here.

All cognitive tasks evaluated problem-solving strategies with respect to categorization and sequential reasoning. The complexity of items increased as a function of the number of relevant details involved. Items measured the ability to identify salient task features, to problem-solve systematically, and to organize specific information into a global category. Many of the items also stressed the ability to shift flexibly from one problem-solving approach to an entirely different strategy.

Procedure

Over a two-year period, the delinquent and learning-disabled adolescents were individually evaluated at the Children's Hospital or at a regional detention center. The comparison group was tested in the Watertown schools. A criterion-referenced scoring system was developed to generate appropriate cognitive and educational profiles for each youngster.

RESULTS

1. Similarities and Differences Among the Delinquent, Learning-Disabled, and Comparison Groups in Terms of their Cognitive and Educational Profiles

A consistent trend emerged when the educational performance of the delinquent, learning-disabled, and comparison groups was compared using Analysis of Variance techniques (see Table 3).

Insert Table 3 about here.

It is evident from this table that group differences were highly significant ($P < .01$) in all eight language-arts and mathematics areas. In general, the delinquents' scores reflected weaker educational skills than the other two groups. However, the delinquents displayed similar grade-equivalent scores to the learning-disabled adolescents in reading comprehension, spelling, mathematics, and global written language skills.

When the three groups were compared in terms of their performance on the cognitive inventory, the Analysis of Variance revealed significant differences on five subtests (see Table 4).

Insert Table 4 about here.

Inspection of this table indicates that the groups differed significantly in their performance in three verbal cognitive areas: Picture Classification, Similes, and Grouping. In the non-verbal area, two of the three tasks differentiated the groups significantly: Pattern Completion and Number Series. It is interesting to note that the delinquent group obtained mean scores similar to the learning disability group on three of the five tasks: Similes, Concept Formation, and Number Series. In general, then, these results suggest many similarities in the cognitive and educational profiles of the delinquents and learning-disabled adolescents.

2. Cognitive and Educational Profiles: Prediction of Membership in The Delinquent and Learning Disability Groups

Discriminant function analysis was applied to determine whether performance on the educational and cognitive inventories predicted group membership (see Table 5).

Insert Table 5 about here.

Results indicated that particular cognitive and educational profiles more accurately predicted the existence of learning disabilities than juvenile delinquency. Specifically, 56% of the delinquent group was categorized correctly as delinquent on the basis of test results, 76% of the comparison group was classified appropriately, and 70% of the learning-disabled group was grouped correctly. It was interesting to note that 14% of the delinquents displayed learning profiles which were similar to those of the learning-disabled adolescents, and 20% of the learning- disabled group demonstrated educational and cognitive performance which matched the performance of the delinquents. Within the delinquent group, 31% were classed as normal achievers on the basis of their educational and cognitive profiles.

CONCLUSIONS

The findings of this study reveal three major conclusions. First, the results suggest the existence of various subtypes of delinquency which could be differentiated using process-oriented cognitive and educational assessment techniques. One subtype was unique to delinquency and possibly reflected a group of children with behavioral and social problems superimposed on specific learning profiles. A second subtype displayed cognitive and educational profiles which were virtually identical to learning-disabled adolescents. The third subgroup was characterized by learning and cognitive profiles which were similar to those of average achievers.

The differentiation of these subtypes was possible primarily as a result of the specific assessment inventory used. This test battery generated descriptions of learning style and error patterns, thus extending the focus of an evaluation beyond a total reliance on grade-level scores. These findings suggest that future studies using profile analysis would help to delineate further the various subgroups of delinquency and to overcome the present limitations inherent in measuring academic performance in a heterogeneous population. Such research could be helpful for elucidating the specific combinations of educational, developmental, socio-economic and behavioral factors which characterize these different subgroups.

Second, these findings suggest that juvenile delinquency may represent one possible end-result of a specific learning disability. In this study, it was noteworthy that application of the traditional analysis techniques indicated more severe educational delays in the delinquents than in the learning-disabled youngsters. However, when a multidimensional analysis system rather than a comparison of mean scores was used to analyze results, findings reflected the existence of a subgroup of delinquents with learning profiles similar to those of learning-disabled students. In other words, these different delinquency subtypes were identified only after application of a specific statistical method.

Therefore, the results of this investigation support the conclusions of Offord (1983). That is, in some children, learning problems and behavioral disorders may occur simultaneously. In others,

common factors may contribute to the development of both learning disabilities and juvenile delinquency. Furthermore, learning disabilities may often lead to school failure and low self-esteem. The negative self-image associated with poor school achievement may partially contribute to the development of juvenile delinquency. To better understand the nature of this association, longitudal studies are needed that evaluate the natural history of early school failure in both juvenile delinquents and learning-disabled youth.

Finally, data from the newly-developed cognitive and educational inventories used in this study suggest the importance of profile analysis for educational assessment and remediation in treatment programs for delinquents. These measures provide invaluable descriptive information as part of the diagnostic assessment of juvenile delinquents. This detailed profile can form the basis for developing and implementing individualized educational programs for improving not only reading but also written language and overall cognitive and learning strategies. Remediation of basic skills and modifications of learning strategies can, in turn, help to improve academic performance in other content areas such as social studies and science.

Most important, intensive individualized remedial programs may be essential for all children exhibiting learning disorders to prevent the possible onset of delinquency and to contribute to a more positive outcome. These findings suggest that multiply disadvantaged youngsters from poor social circumstances who exhibit learning disorders may require highly individualized school programs. These should be non-punitive, tailored to the specific learning and cognitive style of each child, and coordinated with a range of services. Thus, an

awareness of each adolescent's specific style of approaching academic and non-academic situations might constitute one of the most critical components of a treatment program with positive impact first in the classroom and then in society.

Table 1

Educational Inventory

Educational Skill	Diagnostic Measures	Examples of Qualitative Observations	Examples of Error Analysis
Reading			
Word Recognition	Spache Diagnostic Reading Scales	Guessing at unknown words from context	Frequency of word substitutions, omissions, phonetic and visual errors
Comprehension	Spache Diagnostic Reading Scales	Word-by-word reading	
Rate and Style		Fluency of oral responses	Incorrect or incomplete recall of information
Spelling	Screening Inventory of Spelling Skills (The Children's Hospital)	Reversals, subvocalizing, erasures	Frequency of confused sequences, reversals, omissions, substitutions
Written Expression			
Global Rating	Diagnostic Writing Inventory (The Children's Hospital)	Legibility, fluidity, maintenance of motor sequences	Frequency of reversals, poor spatial orientation. limited legibility
Mechanics of Production	Copying, Dictation, Read a sentence and reproduce from memory, Reproduce automatized sequences, Written formulation (picture	Retracings, letter reversals, erasures	
Organization		Organization on page, word and letter spacing	Frequency of poor spacing
Language Usage		Sentence construction, grammatical usage	Limited productivity (few words per sentence)
Speed			
Mathematics			
Computation	Wide Range Achievement Test	Error type, confusion of operations, computational and spatial confusions	Frequency of errors in the application of various operations (eg. addition, multiplication)

Table 2

Cognitive Inventory

Task	General Description	Cognitive Features
Picture Classification	Identify the common features in two pictures	Ability to generate multiple vs. single categories
Similes	Identify the common elements in two verbal concepts	Use of general vs. specific criteria for categorizing
Concept Formation	Match parts with wholes (e.g., "Tail & fur go with...?")	Use of general vs. specific criteria
Grouping	Categorize three objects within one group	Use of general vs. specific criteria
Object Classification	Sort sets of four pictures into multiple groups	Flexibility of problem-solving
Pattern Completion	Complete a simple, unfamiliar geometric pattern	Spatial reasoning
Number Series Completion	Identify the rule underlying a number series, and apply that rule to complete a series	Pattern detection and sequential reasoning using a symbol system (numbers)
Object Series Completion	Determine the rule underlying a series of objects or geometric patterns to complete a sequence	Pattern detection using a nonverbal system (geometric shapes)

Table 3

Educational Performance of the Delinquent, Learning-Disabled and Comparison Groups

	Delinquent		Learning-Disabled		Comparison		F
	Mean	s.d.	Mean	s.d.	Mean	s.d.	
Reading: Word recognition (grade-level)	6.05	1.47	7.11	1.78	7.03	0.70	9.[illegible]***
Reading Comprehension (grade-level)	6.23	1.93	6.57	1.69	7.82	1.02	13.72***
Spelling (grade-level)	6.17	2.44	6.33	1.56	7.76	2.71	6.17*
Mathematics (grade-level)	5.60	1.93	5.52	1.60	6.95	2.45	6.55*
Written Language (good performance = low score, poor performance = high score)							
Global Rating	10.36	3.24	11.00	4.06	7.26	3.83	12.86**
Mechanics	9.83	3.07	7.65	2.87	7.54	3.49	7.12**
Organization	5.66	2.24	3.27	1.28	4.16	2.20	13.46**
Language Usage	5.67	1.95	4.4	1.40	3.45	2.00	18.72**

Table 4

Cognitive Performance of the Delinquent

Learning-Disabled and Comparison Groups

	Delinquent (N = 53)		Learning Disabled (N = 26)		Comparison (N = 50)		F
	mean	s d	mean	s.d.	mean	s.d.	
Verbal Subtests							
Picture Classification	7.70	1.37	7.46	1.71	8.51	1.18	5.89*
Similes	3.54	0.64	3.73	0.53	3.89	0.38	5.53*
Concept Formation	2.52	0.72	2.44	0.82	2.76	0.83	1.62
Grouping	3.41	0.64	3.12	0.59	3.51	0.51	3.91*
Object Classification	3.28	1.41	3.74	1.31	3.75	1.15	1.87
Nonverbal Subtests							
Pattern Completion	2.39	2.11	4.00	1.77	4.21	1.86	12.44***
Series Completion	16.53	5.16	19.36	6.10	18.00	4.99	2.49
Number Series	2.04	1.56	2.35	1.70	3.04	1.16	6.33*

Note: Cognitive scores based on a 2,1,0 rating system for each item within a test

Table 5

Utility of the Cognitive and Educational Inventories for Predicting the Group Membership of Adolescents

ACTUAL GROUP MEMBERSHIP	PREDICTED GROUP MEMBERSHIP						
	n	Delinquent		Learning-Disabled		Comparison	
		n	%	n	%	n	%
Delinquent	36	20*	56*	5	14	11	31
Learning Disabled	20	4	20	14*	70*	2	10
Comparison	41	8	20	2	5	31*	76*

* Correct prediction of group membership on the basis of discriminant function analysis.

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